Catalogue no. 75-006-X
ISSN 2291-0840

Insights on Canadian Society

Association between the frequency of cannabis use and selected social indicators

by Darcy Hango and Sébastien LaRochelle-Côté

Release date: May 3, 2018

Statistics Canada Statistique Canada

Canada

How to obtain more information

For information about this product or the wide range of services and data available from Statistics Canada, visit our website, www.statcan.gc.ca.

You can also contact us by

email at STATCAN.infostats-infostats.STATCAN@canada.ca

telephone, from Monday to Friday, 8:30 a.m. to 4:30 p.m., at the following numbers:

- Statistical Information Service 1-800-263-1136
- National telecommunications device for the hearing impaired 1-800-363-7629
- Fax line 1-514-283-9350

Depository Services Program

- Inquiries line 1-800-635-7943
- Fax line 1-800-565-7757

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner. To this end, Statistics Canada has developed standards of service that its employees observe. To obtain a copy of these service standards, please contact Statistics Canada toll-free at 1-800-263-1136. The service standards are also published on www.statcan.gc.ca under "Contact us" > "Standards of service to the public."

Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

Published by authority of the Minister responsible for Statistics Canada

© Her Majesty the Queen in Right of Canada as represented by the Minister of Industry, 2018

All rights reserved. Use of this publication is governed by the Statistics Canada Open Licence Agreement.

An HTML version **is also available.**

Cette publication est aussi disponible en français.

Association between the frequency of cannabis use and selected social indicators

by Darcy Hango and Sébastien LaRochelle-Côté

Overview of the study

Based on data from the 2015 Canadian Tobacco, Alcohol and Drugs Survey and the 2014 General Social Survey on Victimization, this article examines recent cannabis use in Canada, with a focus on the characteristics of people who use cannabis. It also discusses the harmful effects from cannabis consumption reported by those who use cannabis, as well as the association between frequency of cannabis use and selected social indicators such as self-reported health, confidence in police and the justice system, and victimization.

- At the time of survey collection, about 45% of people aged 15 and over reported that they had ever tried or used cannabis in their lifetime. About 7% said that they had used it in the past month, and 1.5% reported that they had used cannabis daily in the past month.
- In 2015, more than 13% of young adults between the ages of 20 and 29 used cannabis weekly or daily, compared with 2% for those aged 55 and over. Meanwhile, 8% of men and 3% of women aged 15 and over used cannabis weekly or daily.
- One-quarter of adults in Canada had tried or used cannabis by the time they were 18. Of those who said that they first tried cannabis when they were 14 or under, 31% said that they currently used it at least on a weekly basis.
- There is a link between the presence of a physical or mental health disability and frequent cannabis use. In addition, people who used cannabis more frequently had lower levels of confidence in the police and the justice system and were more likely to report that they had been victim of a violent crime in the past year.
- About 17% of past-year users of cannabis said they also used other illicit drugs. Among them, 21% reported that they had suffered a harm to their physical health due to drug use compared with 5% for those who used cannabis only.

Introduction

Changes to legislation legalizing non-medical cannabis use—legislation that will likely have important societal effects—will take effect in Canada within the coming year. Recent evidence[1] suggests that cannabis consumption has gone through various up-and-down periods between 1960 and 2015 among the various age groups. In the late 1960s and early 1970s, for example, there was a rapid increase in the consumption of cannabis among youth (aged 15 to 24)—a rate that then levelled off before declining in the early 1990s. The cannabis consumption rate of youth increased again until the early 2000s before starting to slowly decline until 2015. Among adults aged 25 to 44, while cannabis consumption is always lower than for the population aged 15 to 24, it does show a slow linear increase over time from the 1970s to 2015. While the population aged 45 to 64 has the lowest consumption rates, theirs also began to climb starting in the early 2000s. Moreover, as another recent study

found, cannabis use among youth aged less than 25 has declined or been more or less stable since 2004, while for adults over age 25 it has risen during this same period.[2]

The aforementioned pattern notwithstanding, the fact remains that legalizing cannabis could have an effect on consumption patterns and influence the health, life, and well-being of the population. While the literature on the effects of the legalization of cannabis is in its infancy, the most relevant findings from a Canadian perspective come from American states that have already undergone legalization. Those studies, which used data pre- and post-legislation, found that the frequency of cannabis use was not affected by the introduction of legislation to make it legal.[3] Evidence on cannabis decriminalization from Australia and the United Kingdom yielded similar results.[4]

While we do not yet know the impact of legalizing non-medical cannabis use in Canada, a recent report on drug use among high school students in Ontario found that cannabis is the illicit drug most used by high school students—yearly use rates increase from grade 9 to grade 12. Yet when asked attitudinal questions about their views on cannabis legislation, one-third of students were in favour of legalization, one-third were opposed and one-third were unsure.[5] One of the report's findings was that the majority (close to two-thirds) of Ontario students of high school age said that they did not intend to use cannabis when it becomes legal, while a small proportion (less than 5%) of current users said that they would increase their use of cannabis following legalization.[6] These findings are important in view of the fact that the impending legislation will not permit the sale of cannabis for non-medical purposes to people under age 18 or 19 depending on jurisdiction.

The current literature on the impact of cannabis use on its users is mixed: the effects are varied and can be negative, positive, or null.[7] For instance, some of the recent research has found that regular use of cannabis during adolescence and into adulthood can negatively impact users' dependence on the drug, as well as worsen physical health, psychosocial development and mental health.[8] Other studies have shown that the onset of cannabis use during adolescence is associated with poor educational outcomes, lower income, greater welfare dependence and generally lower life satisfaction.[9] There is also the suggestion that using less harmful drugs like cannabis could lead to using drugs like cocaine or heroin. For that reason, drugs like cannabis are sometimes referred to as gateway drugs.[10] Certain studies nonetheless urge a cautious approach to making causal claims linking cannabis use with other illicit drugs.[11]

This study uses the 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS) and the 2014 General Social Survey (GSS) on Victimization to examine recent cannabis use in Canada (see the *Data sources, methods and definitions* section for details). Three main issues are examined: (1) the characteristics of people who use cannabis (those who report use for medical and non-medical purposes)[12], including age of first cannabis use; (2) self-reported harms related to cannabis consumption; and (3) the association between frequency of cannabis use and social indicators such as self-reported health, confidence in police and the justice system, and victimization.

There are two main limitations with the CTADS and GSS data: (1) Given the cross-sectional nature of the data, temporal order cannot be established—the results therefore focus on strength of associations, and should not be interpreted as causal;[13] and (2) Related to the first limitation, in addition, it is impossible to determine with certainty the impact that other factors related to risky behaviours may have on the relationship between cannabis and the social indicators examined in this paper. For instance, heavy cannabis use may co-vary with other risk behaviours such as heavier consumption of alcohol, and this combined influence may have an impact on the results observed in this paper.

Prevalence of cannabis use varies across personal characteristics

The method used for measuring the prevalence of cannabis use in Canada differs depending on the data source. For example, varying types of questions along with the timeframe respondents are asked about their level of cannabis use will affect estimates. Two common data sources that measure the prevalence of drug use in Canada are the Canadian Community Health Survey (CCHS)[14] and the Canadian Tobacco, Alcohol and Drugs Survey (CTADS). Both ask questions on lifetime cannabis use, the number of times it has been used, and use in the past year, and both produce similar estimates on lifetime use and use in the past 12 months.

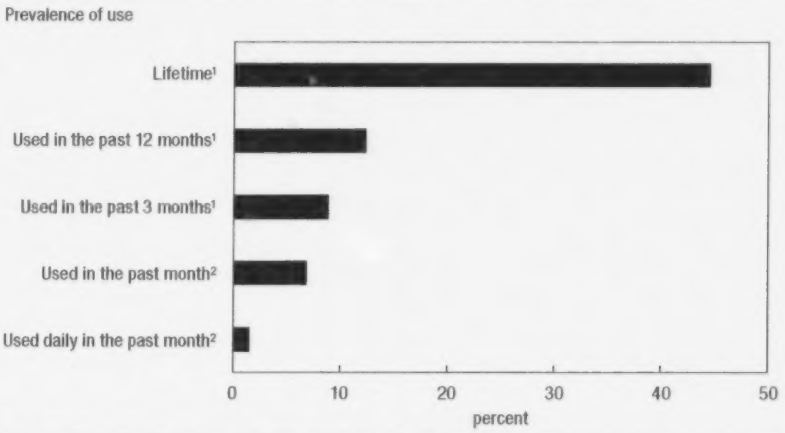
These surveys differ in that the CCHS asks about frequency of use in the past 12 months, while the CTADS asks about frequency of use in the past 3 months.[15] This different timeframe does not allow

for direct comparison between the two data sources. For instance, the CCHS reports that across the entire sample of respondents aged 15 and over, 1.8% said they used cannabis daily in the past 12 months, while in the CTADS, the estimate for daily or almost daily use in the past 3 months for the same age group was 2.9%.

A third data source, the General Social Survey (GSS) on victimization, asks about cannabis use in the past month only, and records the frequency of use for those who respond affirmatively. In 2014, the GSS estimated that 1.5% of the population aged 15 and over used cannabis on a daily basis, which is a rate very similar to the finding produced by the CCHS in 2012. Since it is not possible with the GSS to separate non-users in the past month with those who have never used in their lifetime, the GSS measures of non-users of cannabis therefore include those who never used as well as those who may have used in the past but not in the past month. In this paper, both the CTADS and GSS are used to get as complete a picture of current cannabis use in Canada as possible.

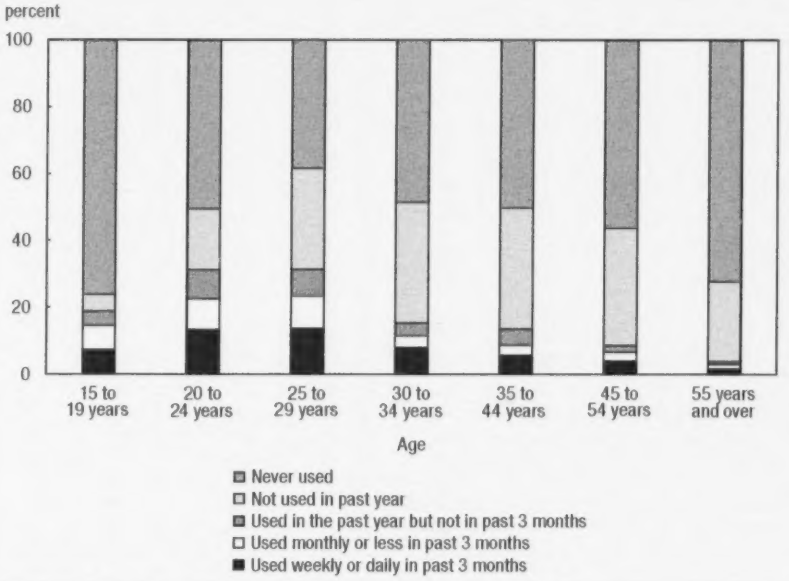
Chart 1 shows individuals' cannabis use for their lifetime, in the past year, in the past 3 months, in the past month, and daily. The first three are derived using the 2015 CTADS, while the latter two use data from the 2014 GSS. Across the entire sample of individuals aged 15 and over, about 45% said that they had ever tried or used cannabis; 12% said they used it in the past year; about 9% in the past 3 months; about 7% in the past month; and 1.5% used cannabis daily in the past month. These results correspond closely to those reported using the CCHS[16] and the Canadian Alcohol

Chart 1
Prevalence of cannabis use among individuals aged 15 and over, 2014 and 2015



1. The data source is the Canadian Tobacco, Alcohol and Drugs Survey (CTADS), 2015.
2. The data source is the General Social Survey (GSS), 2014.
Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015; General Social Survey, 2014.

Chart 2
Distribution of population aged 15 and over by frequency of cannabis use, by age, 2015



Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

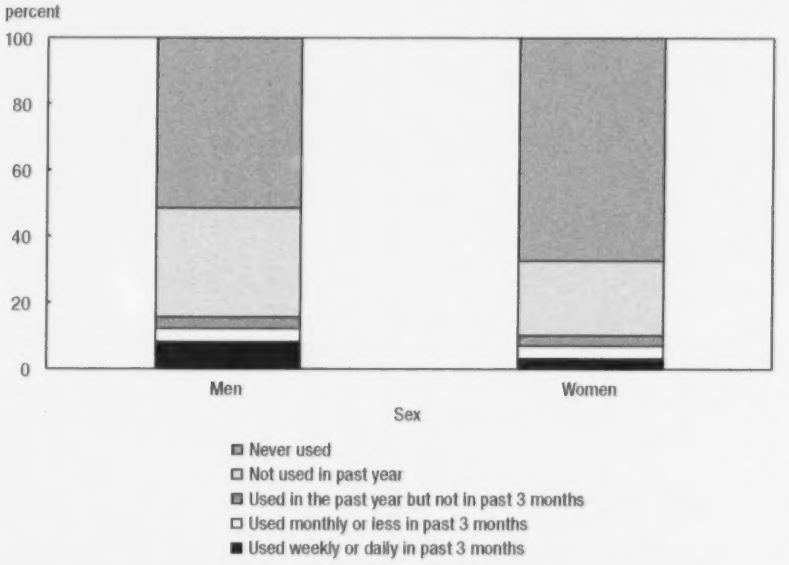
and Drug Use Monitoring Survey (CADUMS) conducted by Health Canada.[17]

Cannabis use, however, is not distributed evenly throughout the population. Age, in particular, is a major factor affecting the likelihood of whether someone has used cannabis. Over 30% of respondents in their 20s said that they used cannabis in the past year, which steadily decreases with each age group to a low of 4% for those aged 55 and over (Chart 2). The proportion of those who use cannabis frequently is also highest among young adults between the ages of 20 and 29, with close to 15% saying that in the last 3 months they used cannabis at least on a weekly basis. Meanwhile, 2% of adults aged 55 and over said they used cannabis with the same frequency.[18]

Cannabis use also varies by sex, both in terms of lifetime prevalence and frequency of use (Chart 3). Almost half of men (48%) reported that they had used cannabis in their lifetime (compared with 32% for women). Men also reported higher rates of cannabis use in the past year, but the difference was not as large (16% versus 10%). In addition, men used cannabis on a weekly or daily basis at a higher percentage than women: 8% of men and 3% of women reported using cannabis on a weekly or daily basis over the past 3 months.

Cannabis use also varies by more than just age and sex. When results are adjusted for age and sex differences, individuals with less than a high school education have a significantly lower prevalence of cannabis use in the past month (6%) than those with a high school diploma or a non-university postsecondary (PSE) diploma (Table 1). Moreover, about 2% of those with a university degree

Chart 3
Distribution of population aged 15 and over by frequency of cannabis use, by sex, 2015



Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

said they used cannabis at least two to six times in the past week, a value significantly lower than the 3% for those with less than a high school education. After taking age and sex differences into account, students were also less likely to use cannabis than those who were employed during the last year.[19]

With respect to household income, those who live in households earning less than $40,000 annually use cannabis more frequently than those at higher income levels, a finding that holds for those who use on a monthly basis as well as for those who used at least two to six times a week. Furthermore, the married / common law population has a significantly lower rate of cannabis use than the single, never married population. Lastly, cannabis use is not spread evenly across occupation levels. Those in art, culture, recreation and sport, and in sales and service, as well those in trades, natural resources, and manufacturing and utilities use cannabis more frequently than those in health-related professions.

A quarter of Canadian adults had tried cannabis by the age of 18

A great deal of past work shows that the age when drug use begins has an impact on various outcomes including, but not limited to, issues related to dependence and health, as well as concerns associated with learning and educational attainment.[20] Chart 4 shows the cumulative probability of first cannabis use by age for the entire sample of individuals aged 15 and over, and separately for men and

Table 1
Prevalence of cannabis use in the past month among individuals aged 15 and over, by characteristic, adjusted for age and sex, 2014

	Prevalence of cannabis use in the past month	
	At least once	At least 2 to 6 times a week
	percent	
Total	**6.8**	**3.3**
Highest level of completed education		
Less than high school (ref.)	6.0	3.2
High school only	8.5*	4.4*
PSE - Non-university	7.3*	3.6
PSE - University	5.0	1.7*
Main activity last year		
Employed (ref.)	7.7	3.7
Student	4.1*	1.5*
Caring for children, household work, parental leave	6.8	4.8
Other	11.5*	7.9*
Household income		
Less than $40,000 (ref.)	9.4	4.8
$40,000 to $79,999	7.2*	3.4*
$80,000 to $119,000	6.9*	3.1*
$120,000 or more	4.8*	2.0*
Not stated	7.3*	3.8
Marital Status		
Single, never married (ref.)	8.0	3.9
Married, common law	5.5*	2.4*
Separated/divorced/widowed	9.7	5.8
Type of work or occupation[1]		
Management	6.5	2.5
Business, finance and administration	6.1	2.9
Natural and applied sciences and related	6.6	2.1
Health (ref.)	4.3	2.0
Education, law and social, community and government services	5.3	2.0
Art, culture, recreation and sport	8.5*	4.5*
Sales and service	8.1*	3.7*
Trades, transport and equipment operators and related	9.2*	5.3*
Natural resources, agriculture and related	9.1*	4.0
Manufacturing and utilities	7.4*	2.7
No occupation	5.0	2.9

* significantly different from reference category (ref.) ($p < 0.05$)

1. Refers to job in the past week among those who were employed, or last job held in the past 12 months among those who were not employed.

Source: Statistics Canada, General Social Survey, 2014.

women.[21] One of the main findings is the steep uptake of first cannabis use between the ages of 15 and 18. By age 15, 9% of the population had ever tried or used cannabis. This increased to 15% by the age of 16 and to 25% by 18. Thus, one-quarter of the adults in Canada had tried or used cannabis by the time they were 18.[22]

Differences were seen between men and women, the result of a steeper increase in cannabis initiation after age 16 among men. At age 15 for example, 10% of men had ever tried cannabis while the rate for women was 7%, however, by age 16 this rate increased to 18% for men and 12% for women. This percentage point difference between men and women increases to around 15 points by the time young adults are in their late 20s and remains consistent thereafter.

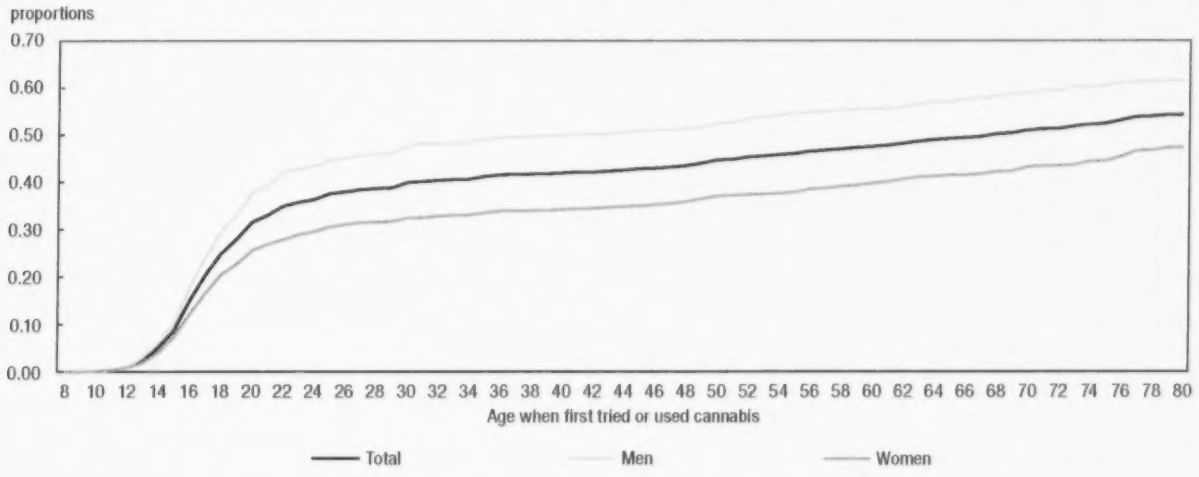
There is an association between age of first use and frequency of cannabis use as adults.[23] Hence, among those who said they first tried cannabis at age 14 or younger, 31% said that they currently used cannabis on a weekly or daily basis (Chart 5). By contrast, among those who first tried cannabis when they were 16 or over, less than 13% said that they currently used this substance on weekly or daily basis.

People who use cannabis on a frequent basis are more likely to report harmful effects from cannabis consumption

In the CTADS, information on problems or issues related to the consumption of cannabis is available for those who have ever used cannabis more than once. Results are shown separately for those who first tried cannabis at the age of 14 or under and for those who first tried it after the age of 14, as well as by frequency of use.[24]

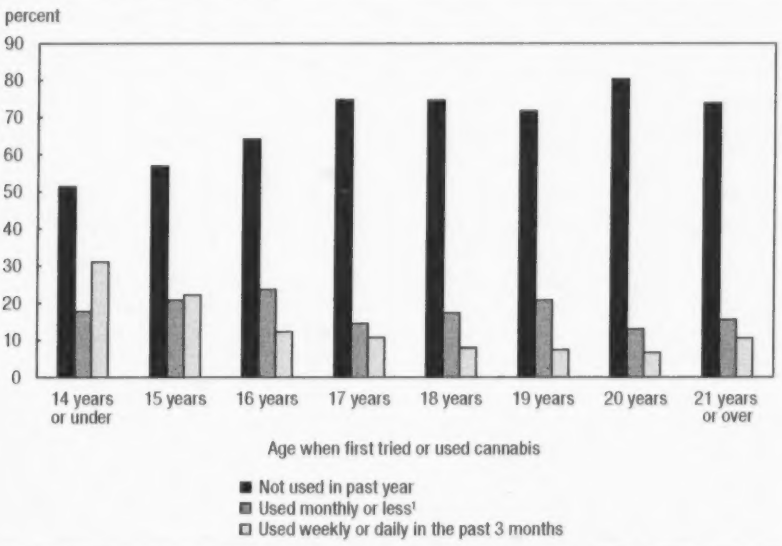
Among those who ever used cannabis, 9% said that they ever had a strong urge or desire to use cannabis, while about 3% said that they had at some point in their life tried unsuccessfully to control, cut down or stop using cannabis. Meanwhile, about 4% said that their cannabis use had led to health, social, legal or financial problems, while around 7% said that their cannabis use had affected their ability to do expected tasks—and that a friend or relative had expressed concern about their cannabis use.

Chart 4
Cumulative proportion of population trying or using cannabis for the first time, by age of first use, 2015



Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

Chart 5
Frequency of cannabis use reported by those who have ever used cannabis, by age of first cannabis use, 2015

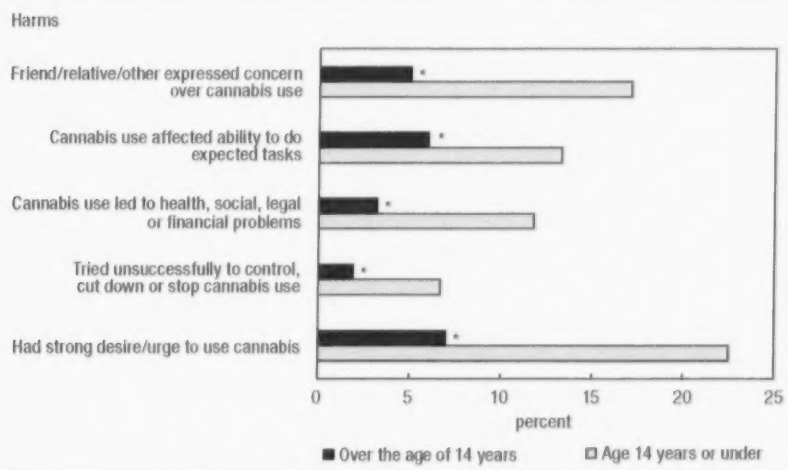


1. Includes people who used cannabis monthly or less in the past 3 months and people who used it in the past year but not in past 3 months.
Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

In addition, given the relationship between the age when cannabis is first tried and a greater prevalence of recent cannabis use, the proportion of those who reported problems related to cannabis use was significantly higher[25] in the case of people who began to use cannabis at an earlier age and among those who used it more frequently.

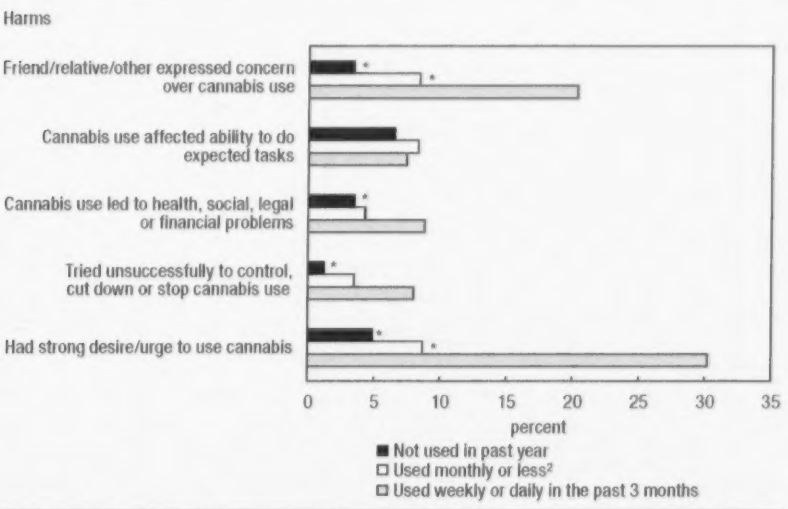
For instance, 23% of people who first tried cannabis when they were aged 14 or under said they had at some point in their life had a strong desire or urge to use it; this rate drops to 7% if they first used cannabis after the age of 14 (Chart 6a). Meanwhile, the corresponding rate for those who use cannabis on a weekly or daily basis was 30%, 9% for those who used it monthly or less, and 5% for those who had not used it in the past year (Chart 6b). Similarly, about 7% of those who first tried cannabis when they were 14 or under said they had ever tried unsuccessfully to

Chart 6a
Proportion reporting harmful effects associated with cannabis consumption, by age of first use,[1] 2015



* significantly different from age 14 or under ($p < 0.05$)
1. Includes all people aged 15 and older who have ever tried cannabis.
Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

Chart 6b
Proportion reporting harmful effects associated with cannabis consumption, by frequency of use,[1] 2015



* significantly different from Weekly or daily ($p < 0.05$)
1. Includes all people aged 15 and over who have ever tried cannabis.
2. Includes people who used cannabis monthly or less in the past three months and people who used it in the past year but not in past 3 months.
Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

control, cut down or stop cannabis use; this compared with 2% among those who first tried cannabis when they were over 14. Moreover, 8% of those who use on a weekly or daily basis said the same, while the rate drops to less than 4% for those who use it monthly or less often, and 1% for those who had not used it in the past year. A similar pattern is noted for each of the harms resulting from cannabis use.

There is a link between the presence of a physical or mental health disability and frequency of cannabis use, particularly among women

Past literature discusses at length the relationship between cannabis use and health. According to a recently published American study,[26] for instance, the association between cannabis use and health is complex and research shows mixed results.[27] The literature shows that the link appears to be dependent on factors such as the health factor under consideration, the timeframe (long- or short-term) as well as the population of interest. As a result, it is difficult to come up with a simple summary of the relationship between cannabis use and the health of the people who use it.

Nonetheless, in this study, two self-reported measures of disability are examined: (1) presence of a physical disability (which includes daily activities being limited by difficulty with mobility, bending down and picking up things, using fingers, and pain); and (2) an emotional, psychological or mental health disability (that may include anxiety, depression, bipolar disorder, substance consumption problems, anorexia, etc.) that at least sometimes limits daily activities.

Among those who used cannabis every day, 42% of women and 26% of men reported that they had a physical disability. This compared with 19% of women and 13% of men who had not used cannabis in the past month (Chart 7).

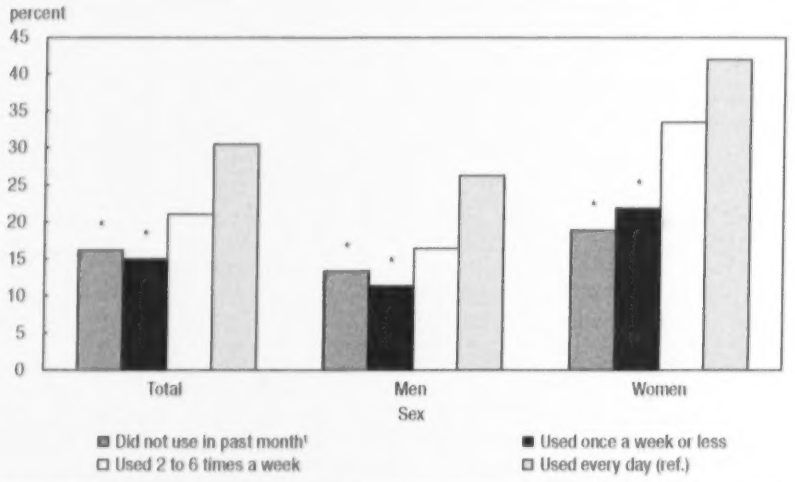
The presence of a disability related to mental health is also associated with more frequent cannabis use in the past month. About 8% of all women said they had such a condition, while 4% of men said the same. The proportion of those reporting a disability related to mental health was higher among those who used cannabis more frequently, especially among women. For example, among women who had used cannabis every day in the month preceding the survey, 43% reported a disability related to mental health, compared with 7% among those who had not consumed cannabis in the past month (Chart 8).[28] In other words, 36 percentage points separated women who had not used cannabis in the past month from those who used it on a daily basis. Among men, the same difference was 7 percentage points.[29]

Such results do not necessarily suggest that cannabis use leads to detrimental health outcomes. Rather, it could mean that individuals who have health issues use cannabis to alleviate their symptoms. The GSS, however, does not ask respondents about the reasons why cannabis was used; consequently, the results must be interpreted as associations and not as cause and effect relationships.

People who use cannabis frequently had lower confidence in the police and the justice system

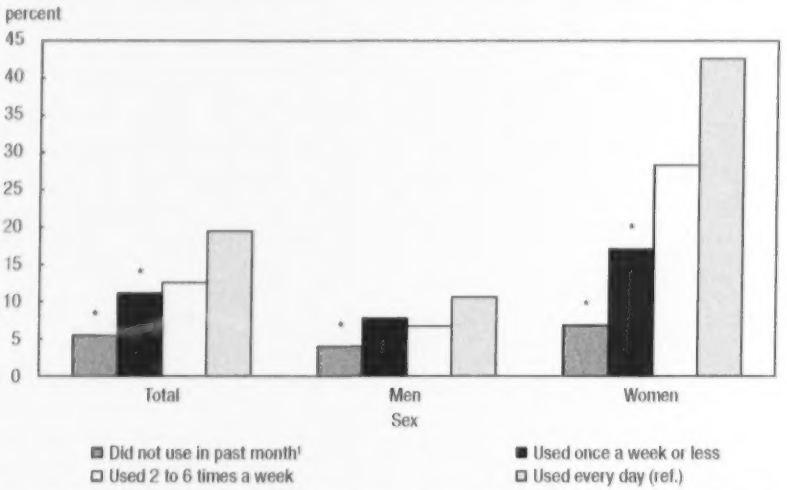
Past work has found that in general Canadians have a relatively high level of trust in both the police and

Chart 7
Proportion of individuals aged 15 and over who reported a physical disability, by sex and frequency of cannabis use in the past month, 2014



* significantly different from reference category (ref.) ($p < 0.05$)
1. Include those who never used cannabis as well as those who may have used it in the past but not in the past month.
Source: Statistics Canada, General Social Survey, 2014.

Chart 8
Proportion of individuals aged 15 and over who reported that they had a disability related to mental health, by sex and frequency of cannabis use in the past month, 2014



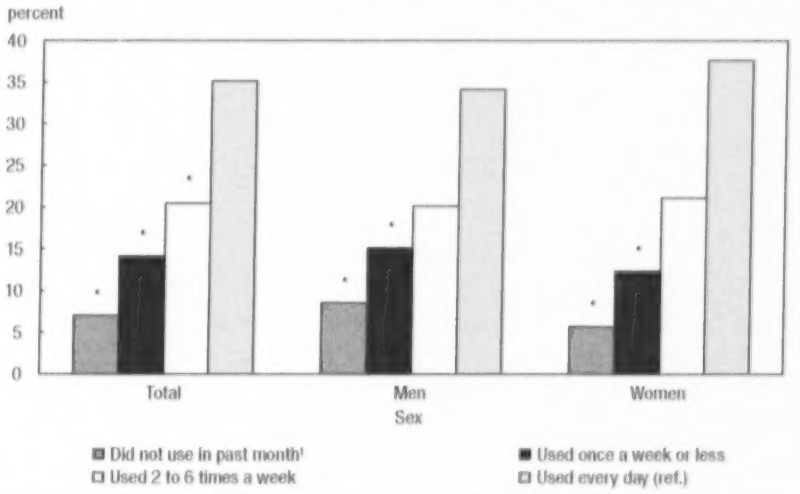
* significantly different from reference category (ref.) ($p < 0.05$)
1. Include those who never used cannabis as well as those who may have used it in the past but not in the past month.
Source: Statistics Canada, General Social Survey, 2014.

the justice system and courts.[30] These high levels of confidence are important indicators of a greater sense of belonging to the country and to greater social cohesion.[31] Lower levels of confidence, conversely, may point to a disconnection or a general mistrust of these institutions. In this section, the association between cannabis use and confidence in police and the criminal courts is examined. The overall distribution of confidence in these two institutions is split into lower ('not very much' and 'none') and higher ('a great deal' and 'some').

In general, men have significantly lower levels of confidence in both the police and the criminal court system. Among all individuals aged 15 and over, about 10% of men and 6% of women said they had a lower level of confidence in the police, while the corresponding figures for lower confidence in the court system are 26% and 21%, respectively.

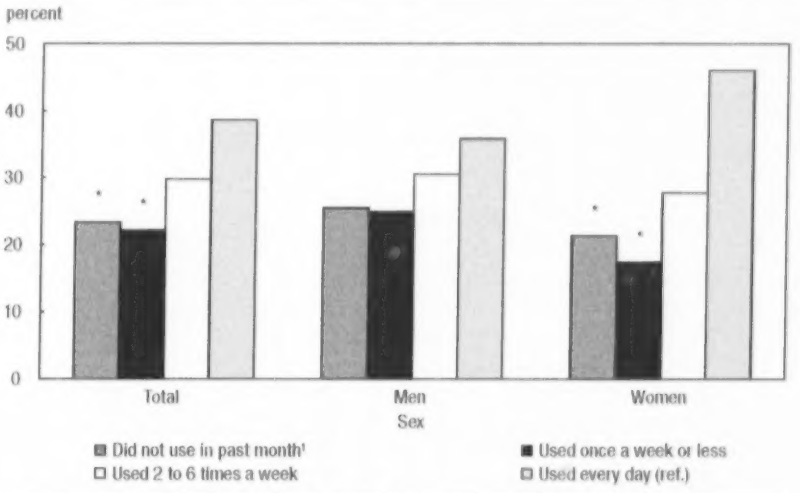
Among those who used on a daily basis, however, it was the opposite: the proportion of those who had a lower level of confidence in these institutions was higher for women than it was for men. For instance, among those who used cannabis on a daily basis, 38% of women and 34% of men had a lower level of confidence in the police, compared with 6% of women and 9% of men who did not use cannabis in the past month (Chart 9). Similarly, 46% of women who used cannabis on a daily basis had a lower level of confidence in the justice system, compared with 21% of women who did not use cannabis in the past month (Chart 10).[32] Among men, the relationship between cannabis use and confidence in the justice system was not significant.

Chart 9
Proportion of individuals aged 15 and over who reported that they had low confidence in police, by sex and frequency of cannabis use in the past month, 2014



* significantly different from reference category (ref.) ($p < 0.05$)
1. Include those who never used cannabis as well as those who may have used it in the past but not in the past month.
Source: Statistics Canada, General Social Survey, 2014.

Chart 10
Proportion of individuals aged 15 and over who reported that they had low confidence in the criminal court system, by sex and frequency of cannabis use in the past month, 2014



* significantly different from reference category (ref.) ($p < 0.05$)
1. Include those who never used cannabis as well as those who may have used it in the past but not in the past month.
Source: Statistics Canada, General Social Survey, 2014.

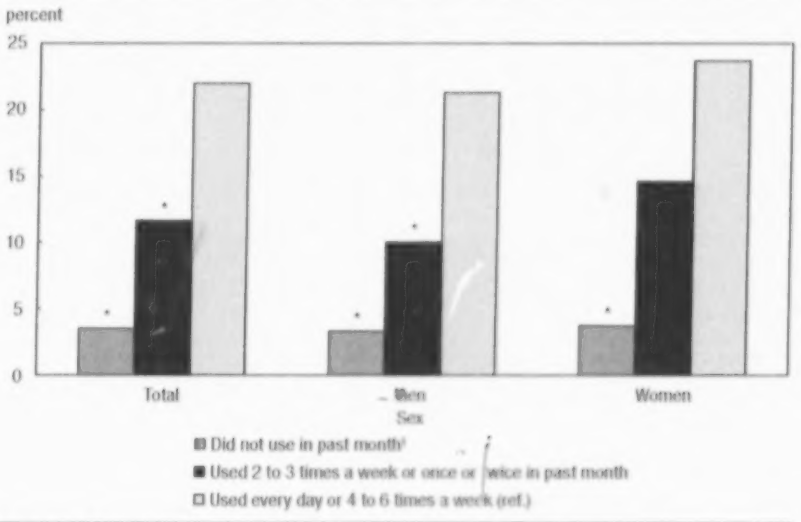
Even after accounting for other factors, those who use cannabis more frequently are more likely to report that they have been victims of a violent crime

Past research has found a significant association between cannabis use and victimization,[33] and the relationship may be partially explained by behavioural choices or lifestyles that expose those who use cannabis to greater risk and situations where the probability of violence is higher.[34] The exact nature of the relationship cannot be disentangled here given the cross-sectional nature of the data, however, what is revealed is a significant association between cannabis use in the past month and the risk of violent victimization in the past year.[35]

To study the relationship between cannabis use and self-reported victimization, the recent use of cannabis categories have been collapsed (due to sample size) into three categories: (1) did not use in the past month; (2) used two to three times a week or once or twice in the past month; and (3) used every day or four to six times a week. In all, about 4% of men and women said they were violently victimized in the past year. However, this rate is higher for both men and women who also said they used cannabis in the past month, especially among those who said they used four to six times a week or more. For example, about 24% of women and 21% of men who used cannabis at least four to six times a week stated that they had also experienced a violent victimization in the past year (Chart 11).

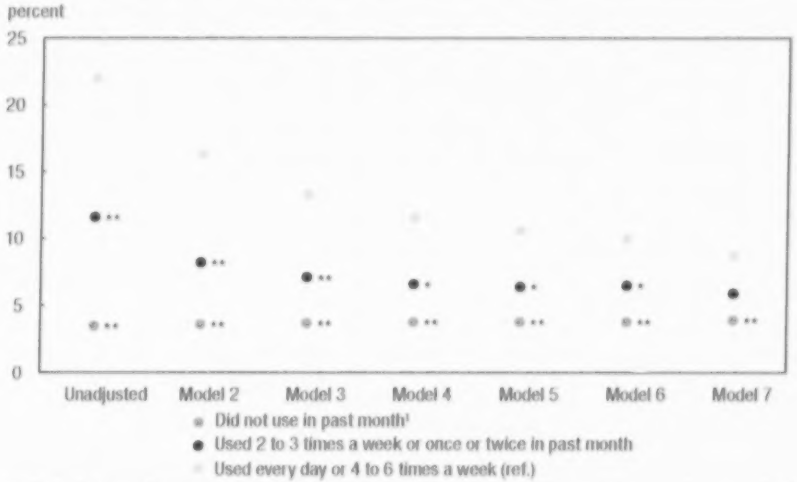
There are many factors, ranging from mental health to lifestyle choices that likely have an association with drug use and victimization. These

Chart 11
Proportion of individuals aged 15 and over who reported that they experienced violent victimization in the past year, by sex and frequency of cannabis use in the past month, 2014



* significantly different from reference category (ref.) ($p < 0.05$)
1. Include those who never used cannabis as well as those who may have used it in the past but not in the past month.
Source: Statistics Canada, General Social Survey, 2014.

Chart 12
Predicted probability of experiencing a violent victimization in past year, by frequency of cannabis use in the past month, 2014



* significantly different from reference category ($p < 0.05$)
** significantly different from reference category ($p < 0.01$)
1. Include those who never used cannabis as well as those who may have used it in the past but not in the past month.
Source: Statistics Canada, General Social Survey, 2014.

factors are introduced in a series of multivariate logistic regressions, whose results are presented as predicted probabilities[36] for ease of interpretation (Chart 12). Seven models are used: (1) bivariate; (2) adds age and sex; (3) adds highest level of education, Aboriginal self-identification, visible minority status, country of birth, main activity in the past year (such as being a student or working), household income, and marital status; (4) adds self-reported mental health; (5) adds measures of residential stability including, length of time in the current neighbourhood, number of moves in the past five years, renter or homeowner, and whether one had ever been homeless; (6) adds neighbourhood characteristic variables such as population size, perceived social disorder, and sense of belonging to the neighbourhood; and (7) adds lifestyle measures, including the average number of times in a month that the respondent says they go out to bars, clubs or pubs in the evening, as well as alcohol consumption and other illicit drug use in the past month.[37]

At no point is the difference between the highest level of cannabis use frequency (every day / four to six times a week) and other levels of frequency completely removed. For example, in the unadjusted case, there is a 19 percentage point difference between those who frequently used cannabis (every day or 4 to 6 times a week) and those who did not use it. Adding age and sex lowered this difference to 13, while adding mental health lowered it further to 8 percentage points. Even in Model 7, with the most extensive set of covariates, 5 percentage points separated those who used cannabis more frequently from those who did not use it (9% versus 4%).

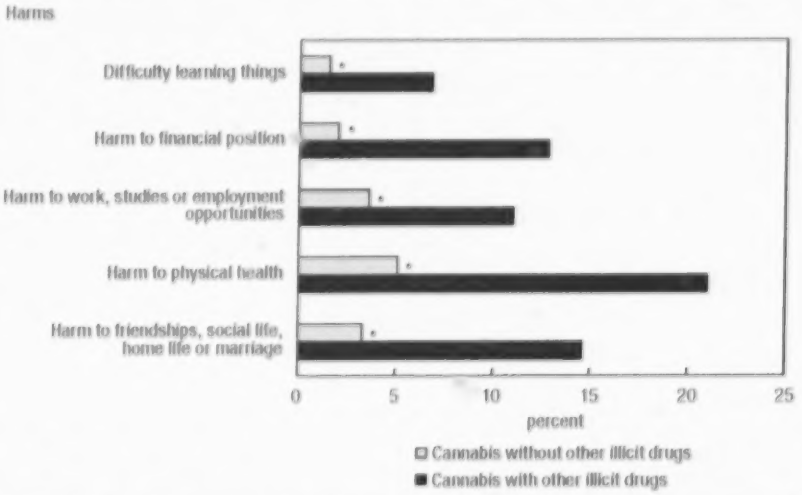
Thus, for the most part, cannabis use is associated with a higher probability of violent victimization. These results suggest that the relationship between recent cannabis use and the risk of victimization cannot be explained away by factors that may also be associated with drug use and victimization.[38]

People who use both cannabis and other illicit drug use are more likely to report adverse effects from drug use

While past work has found that most[1] people who use other illicit drugs (such as cocaine, heroin and methamphetamines) are also users of cannabis, few users of cannabis used these other types of drugs.[39] Similar results are found with CTADS data: about 17% of past-year users of cannabis said they also used other illicit drugs in the past year, while almost 90% of those who said that in the past-year they used other illicit drugs also said they used cannabis in the past year. Further work is needed to explore whether these types of findings support the notion that cannabis acts as a gateway drug, whereby its use may lead to a greater risk of using other illicit drugs in the future.[40]

Cannabis use in the absence of other illicit drugs has been found to have fewer adverse effects (on social relationships and friendships, physical health, work, educational studies and employment opportunities, financial position, and ability to learn) than when cannabis is used simultaneously with these other drugs.[41] Respondents who use other illicit drugs are defined as those who said that in the past year they used any of the following drugs: cocaine,

Chart 13
Proportion reporting harmful effects associated with drug use in the past year, persons who used cannabis only and persons who used cannabis with other illicit drugs, 2015



* significantly different from cannabis with hard drugs ($p < 0.05$)
Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

speed/methamphetamine, ecstasy, hallucinogens, heroin, inhalants and salvia.[42,43] Results are presented separately for those who said they used cannabis in the absence of other illicit drugs and for users of cannabis who also used other illicit drugs. Readers should keep in mind that, across the entire sample (individuals aged 15 and over), close to 90% did not use cannabis or other illicit drugs in the past year, while about 10% used cannabis without other illicit drugs. Moreover, 2% used cannabis and other illicit drugs, while 0.3% used other illicit drugs in the absence of cannabis.[44]

Results show that cannabis use in conjunction with other illicit drug use is associated with a higher probability of adverse effects than cannabis use on its own, a finding that likely points more to the detrimental impact of other illicit drugs than to the presence of cannabis.

For example, about 5% of people who used cannabis without using other illicit drugs in the past year said they experienced a harm to their physical health because of drug use—a proportion that was more than 20% among those who used cannabis who also used other illicit drugs (Chart 13). A similar pattern was observed for all five harms examined. For example, close to 15% of people who used cannabis and who also used other illicit drugs said they experienced harm to their friendships, social life or home life, and marriage, compared with about 3% for those who only used cannabis.

Conclusion

Cannabis legislation in Canada within the next year will likely alter the landscape for drug use. The goal of this paper was to use two relatively recent large-scale nationally representative surveys to examine the characteristics associated with cannabis use as well as the relationship between several social indicators and cannabis use—before legislation takes effect. This study found that, in terms of prevalence, almost one-half of the Canadian population aged 15 and over said they had ever tried or used cannabis at some point in their life. A further 7% said they had used cannabis in the past month, and 1.5% said they had used it on a daily basis over the past month. Prevalence was higher for men, young adults aged 20 to 29, and those with an annual household income of less than $40,000.

The age when cannabis was first used or tried was found to occur most frequently during adolescence. For example, about 9% said they had tried or used cannabis by the age of 15, however, by 18 that percentage increases to about one-quarter of the Canadian population having tried or used cannabis.[45] The age of first cannabis use has implications for recent cannabis use. For instance, those who first tried cannabis at age 14 or younger currently use cannabis in much higher proportions on a weekly or daily basis than those who first tried it after that age. Such results are important because people who use cannabis frequently are more likely to report harmful effects from cannabis consumption, such as a strong desire or urge to use cannabis or an inability to control or stop its use.

Lastly, the study found a link between the presence of a physical or mental health disability and frequency of cannabis use, especially for women. Some people who use cannabis may use the substance in order to alleviate their symptoms; however, this was not something that could be examined with the current data. There is also an association between daily cannabis use and having a self-reported low level of confidence in police and the court system. Frequent cannabis use is also associated with a higher risk of violent victimization for men and women, a finding that remains even after controlling for a wide range of factors also associated with victimization.

The culmination of these results suggests that, even though no causal link can be made, there is an association between frequency of cannabis use and several social indicators. This study also found that cannabis use in conjunction with other illicit drug use (such as cocaine, heroin and methamphetamines) is associated with a higher incidence of adverse effects than cannabis use on its own, from issues related to physical health, friendships, social life, home life and marriage.

Sébastien LaRochelle-Côté *is editor-in-chief of Insights on Canadian Society at Statistics Canada, and* ***Darcy Hango*** *is a senior researcher with the same group at Statistics Canada.*

Data sources, methods and definitions

Data source

This report uses data from the 2015 Canadian Tobacco, Alcohol and Drugs Survey (CTADS) as well as the 2014 General Social Survey (GSS) on Canadians' Safety (Victimization). The target populations for these two surveys include the non-institutionalized Canadian population aged 15 and over living in the 10 provinces. The data for CTADS were collected throughout the 2015 calendar year while the GSS data collection period was throughout the 2014 calendar year. Responding to the survey is voluntary and the data are collected directly from the survey respondents (self-declared). The final sample size for CTADS 2015 is 15,154, with a 48.4% overall response rate. For the 2014 GSS the final sample size is 33,127, with a 52.9% overall response rate.

Definitions

Two of the indicators used in this paper are related to physical and mental health disability. These disability measures are based on the Disability Screening Questions (DSQ).[46] The DSQ are Statistics Canada's measures of disability. They provide a measure based on the social model of disability that takes activity limitations into account in order to identify a disability. The DSQ are meant to be included in several general population surveys to allow comparisons of people with and without a disability. The GSS 2014 used a shorter version of the DSQ. This paper uses the derived variables related to physical and mental health disability.

Cannabis measurement in this paper comes from two different surveys: the 2015 CTADS 2015 and the 2014 GSS-27. Each uses a somewhat different method of measurement. In the 2015 CTADS, the exact wording used is as follows: "The next questions are about cannabis. In this next series of questions when we use the term marijuana, we mean the use of marijuana, hashish, hash oil or any other preparation of the cannabis plant." The following questions were used in the analysis in this paper:

- During your lifetime, have you ever used or tried marijuana? (yes/no)
- Have you used marijuana just once or more than once? (yes/no)
- During the past 12 months have you used marijuana? (yes/no)
- During the past three months have you used marijuana? (yes/no)
- During the past three months how often did you use marijuana? (once or twice/monthly/weekly/daily or almost daily)
- How old were you when you tried or started using marijuana?

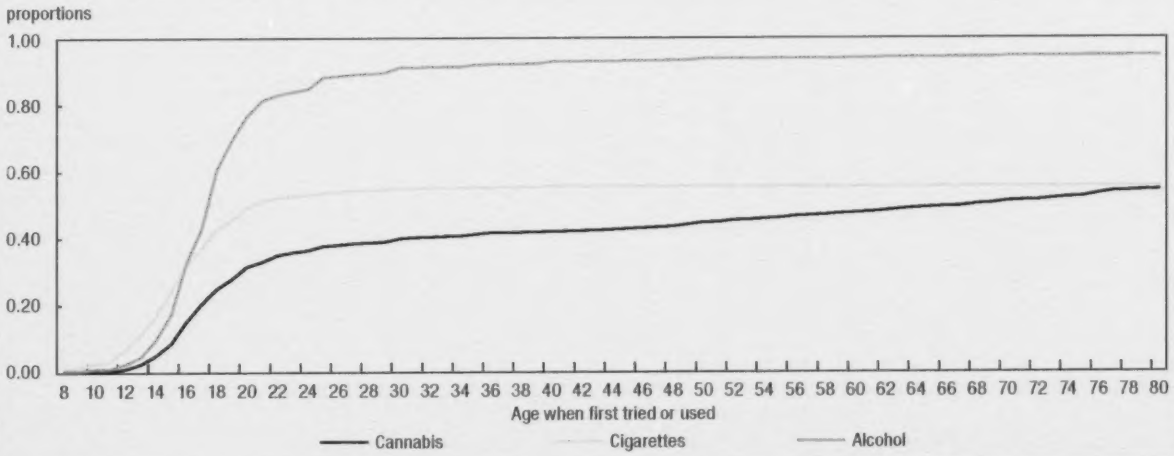
In 2014 GSS, the exact wording used is as follows: "The following questions ask about the use of drugs. Please do not include medications that are taken (on a doctor's prescription) or bought over-the-counter." The following questions were used in the analysis in this paper:

- In the past month, did you use marijuana, hashish, hash oil or other cannabis derivatives? (yes/no)
- How often in the past month, did you use marijuana, hashish, hash oil or other cannabis derivatives? (every day / four to six times a week / two to three times a week / once a week / once or twice in the past month)

Age of first cigarette and alcohol use

The age of first cannabis use follows a similar pattern to the age of first cigarette and alcohol use, except that at each age the use of cannabis is lower. In all cases, however, the typical age at initial use is during adolescence. Hence, by the age of 15, 9% of the sample had first tried cannabis and 17% had tried alcohol, while 24% had tried a cigarette (Chart 14). By the age of 18, 25% had first tried cannabis, 61% had tried alcohol, and 43% had tried a cigarette. And by the age of 25, 38% had tried cannabis, 88% had tried alcohol, and 54% had tried cigarettes. For the latter two, there are very few–only about 2 percentage points for cigarettes–who try these substances for the first time after turning 25. However, there is a 16 percentage point increase in uptake for cannabis after 25 (from 38% to 54%).

Chart 14
Cumulative proportion of the population aged 15 and over trying or using cannabis, cigarettes or alcohol for the first time, by age of first use, 2015



Source: Statistics Canada, Canadian Tobacco, Alcohol and Drugs Survey, 2015.

Notes

1. See MacDonald and Rotermann (2017).
2. See Rotermann and MacDonald (2018).
3. For example, see recent work by Kerr et al. (2018); Hao and Cowan (2017); Dills et al. (2017).
4. See Williams and Bretteville-Jensen (2014); Braakman and Jones (2014).
5. On April 18th, 2018, new data from the National Cannabis Survey (NCS) was released. The NCS asked Canadians about whether they would change their behaviour once cannabis is legalized for non-medical use. It found that 79% of Canadians aged 15 and older would not be more likely to try or to increase their cannabis consumption.
6. See Boak et al. (2017). The question in the survey was: "If cannabis use were made legal for adults tomorrow, which of the following would you be most likely to do in the next 12 months?" Nearly two thirds (62%) of Ontario teens said that they would not try it even if it were legal. About 8% of reported that they would try it, 14% said that they were not sure, and the rest said that they would continue to use it either more often, as often, or less often than they already did.
7. See van Ours and Williams (2011); Volkow et al. (2016); Volkow et al. (2014).
8. See Hall and Degenhardt (2009).
9. See Volkow et al 2014.
10. See Kandel (2002); Secades-Villa et al. (2015).
11. See Van Gundy and Rebellon (2010).
12. The GSS does not distinguish between cannabis use for non-medical purposes and medical use. And while the CTADS does ask about medical use, it is not possible to identify exclusive users of medical cannabis, and for those reporting use of medical cannabis there is no information on the extent of use. Nonetheless, the proportion of those who reported that they used cannabis for medical purposes in the past year was relatively low, at 2.9%. Moreover, given the low sample size for those who use cannabis for medical purposes, examining differences in social indicators between those who use for medical and non-medical purposes would have been difficult.
13. Longitudinal studies have been used to test the robustness of the relationship between cannabis use and health outcomes. For example, a study conducted on a New Zealand longitudinal birth cohort with cognitive measures obtained before cannabis onset, persistent cannabis use over a 20-year period was associated with neuropsychological decline even after controlling for educational attainment (Meier et al., 2012). In contrast, other work that used a longitudinal study on twins did not find a causal link between cannabis use and IQ loss over time (Jackson et al., 2016).
14. Like the GSS, the CCHS does not distinguish between use of cannabis for medical and non-medical purposes.
15. It is important to note that the CCHS and CTADS had different modes of data collection, which may have impacted prevalence rates. In the former most interviews were conducted in person, while in the latter interviews were conducted by telephone.
16. See Rotermann and Langlois (2015).
17. See Bonner et al. (2017).
18. In this study, people who have used cannabis only once are removed (except in Charts 4 and 14). Analysis not shown revealed that, for men and women across all age groups, the proportion who say that they used cannabis only once does not vary greatly and never breaches 10%.
19. In results unadjusted for age and sex, students had a significantly greater proportion than respondents employed in the past year.
20. See Fergusson and Boden (2008); Jackson et al. (2016); Meier et al. (2012).
21. These are weighted Kaplan Meier Life Table estimates. Also, for this analysis in Chart 4, all those who ever used or tried cannabis are included, even those who said that they only used it once.
22. To look at this another way, when only those in the sample who ever used cannabis at least once are included in the analysis, 65% said they had tried or used cannabis for the first time by the age of 18.
23. In Charts 5 and 6b, the category "monthly or less" also includes those who said they had used in the past year but not in the past three months.
24. The age of 14 or under is used as a definition for 'early' cannabis initiation for this section for two main reasons: (1) having a definition at age 14 or younger ensures that every member of the GSS was given equal opportunity to have been an 'early' initiator because GSS collects data only for those age 15 and above, and (2) some recent evidence suggests that cannabis initiation at age 14 or younger may have more harmful effects on cognitive functioning than initiation beyond this age (Fontes et al., 2011).
25. This refers to at least a 0.05 level of significance.

26. See National Academies of Sciences, Engineering, and Medicine (2017).
27. This finding is also echoed in other work on psychiatric disorders. See Di Forti et al (2007).
28. Some supplementary analyses revealed that women are prescribed over-the-counter medication to help with sleep, to calm down, or to help to get out of depression more often than men. However, for people who use cannabis on a daily basis, regardless of use of prescribed medication, the gap between men and women in the presence of a mental health disability remains.
29. Similar results were obtained when those who reported using other illicit drugs in the past month were removed from the sample. Other studies also find gender differences in mental health by cannabis use (van Ours and Williams, 2011).
30. See Cotter (2015).
31. See Cotter (2015); Roberts (2007); Letki (2006).
32. These relationships hold even after adjusting for age and household income. They also hold when users of other illicit drugs in the past month are removed from the sample.
33. See Perreault (2015).
34. See Lilly (2014); Perreault and Brennan (2010).
35. Violent victimization follows a similar definition to Perreault (2015). Respondents were counted as having been violently victimized in the past year if they said that they were sexually assaulted, robbed (where the threat of violence was present) and physically assaulted. Specifically, the six categories were: (1) someone has forced or attempted to force the respondent into any unwanted sexual activity by threatening, holding down or hurting them in some way; (2) someone has touched the respondent against their will in a sexual way; (3) someone has subjected the respondent to a sexual activity in which they were not able to consent; they were drugged, intoxicated, manipulated or forced in other ways than physically; (4) someone has taken or tried to take something from them by force or threat of force; (5) someone attacked them; and (6) someone threatened to hit or attack them or they were threatened with a weapon. In all of these, the acts that may have been committed by a current or previous spouse or common law partner are excluded.
36. In all analyses the predicted probabilities from the logistic regressions are produced via the method of average marginal effects.
37. The use of other illicit drugs in the past month is measured by the following question in the GSS: "In the past month, did you use any other non-prescribed drugs, for example, magic mushrooms, cocaine, speed, methamphetamine, ecstasy, PCP, mescaline or heroin?"
38. Past work using similar multivariate models also found that this association remains after controlling for many covariates (see Perreault 2015).
39. See Rotermann and Langlois (2015).
40. Exploring this association is beyond the scope of this paper. See Secades-Villa et al. (2015) and Van Gundy and Rebellon (2010) as two representative papers that explore the gateway hypothesis.
41. See Muhuri and Gfroerer (2011).
42. The drug "harms" questions were asked of all respondents who said they abused pain relievers, stimulants and sedatives in the past year, and also to those who said in their lifetime they had ever used cannabis, cocaine, methamphetamines, ecstasy, hallucinogens, solvents, heroin or salvia.
43. An alternative variable was created that removed inhalants and salvia, and results were re-estimated. As the results did not change, inhalants and salvia were kept in the definition of other illicit drugs in the analyses presented in this paper.
44. The group of respondents who have used other illicit drugs without cannabis is not included as the sample size was too small when used in combination with drug harms. The estimates in this chart are restricted to those who said they ever used cannabis two times or more.
45. These trends are similar to the uptake of other substances such as alcohol and cigarettes in that the first use is found to occur most often during adolescence (see the section titled *Age of first cigarette and alcohol use* for details).
46. For more information on the DSQ, see Grondin (2016).

References

Boak, Angela, Hayley A. Hamilton, Edward M. Adlaf and Robert E. Mann. 2017. *Drug Use Among Ontario Students, 1977–2017: Detailed Findings from the Ontario Student Drug Use And Health Survey*. CAMH Research Document Series No. 46. Toronto: Centre for Addiction and Mental Health.

Bonner, W.I. Andrew, Mustafa Andkhoie, Charlene Thompson, Marwa Farag and Michael Szafron. 2017. "Patterns and factors of problematic marijuana use in the Canadian population: Evidence from three cross-sectional surveys." *Canadian Journal of Public Health*. Vol. 108, no. 2. p. e110–e116.

Braakmann, Nils and Simon Jones. 2014. "Cannabis depenalisation, drug consumption and crime: Evidence from the 2004 cannabis declassification in the UK." *Social Science & Medicine*. August. Vol. 115. p. 29–37.

Cotter, Adam. 2015. "Public confidence in Canadian institutions." (http://www.statcan.gc.ca/pub/89-652-x/89-652-x2015007-eng.htm) *Spotlight on Canadians: Results from the General Social Survey*. December. Statistics Canada Catalogue no. 89-652-X.

Di Forti, Marta, Paul D. Morrison, Alexander Butt and Robin M. Murray. 2007. "Cannabis use and psychiatric and cognitive disorders: The chicken or the egg?" *Current Opinion in Psychiatry*. May. Vol. 20, no. 3. p. 228–234.

Dills, Angela K., Sietse Goffard and Jeffrey Miron. 2017. *The Effects of Marijuana Liberalizations: Evidence from Monitoring the Future*. NBER Working Paper No. 23779. Cambridge, MA: The National Bureau of Economic Research.

Fergusson, David M. and Joseph M. Boden. 2008. "Cannabis use and later life outcomes." *Addiction*. June. Vol. 103, no. 6. p. 969–976.

Fontes, Maria Alice, Karen I. Bolla, Paulo Jannuzzi Cunha, Priscilla Previato Almeida, Flávia Jungerman, Ronaldo Ramos Laranjeira, Rodrigo A. Bressan, and Acioly T. Lacerda. 2011. "Cannabis use before age 15 and subsequent executive functioning," *British Journal of Psychiatry* Vol. 198, no. 6. p. 442-447.

Grondin, Chantal. 2016. *A New Survey Measure of Disability: The Disability Screening Questions (DSQ)* (http://www.statcan.gc.ca/pub/89-654-x/89-654-x2016003-eng.htm). Canadian Survey on Disability, 2012. Statistics Canada Catalogue no. 89-654-X. Ottawa.

Hall, Wayne and Louisa Degenhardt. 2009. "Adverse health effects of non-medical cannabis use." *The Lancet*. October. Vol. 374, no. 9698. p. 1383–1391.

Hao, Zhuang and Benjamin Cowan. 2017. *The Cross-Border Spillover Effects of Recreational Marijuana Legalization*. NBER Working Paper No. 23426. Cambridge, MA: The National Bureau of Economic Research.

Jackson, Nicholas J., Joshua D. Isen, Rubin Khoddam, Daniel Irons, Catherine Tuvblad, William G. Iacono, Matt McGue, Adrian Raine and Laura A. Baker. 2016. "Impact of adolescent marijuana use on intelligence: Results from two longitudinal twin studies." *Proceedings of the National Academy of Sciences of the United States of America*. February. Vol. 113, no. 5. p. E500–E508.

Kandel, Denise B. 2002. *Stages and Pathways of Drug Involvement: Examining the Gateway Hypothesis*. Denise B. Kandel (ed.). Cambridge, U.K.: Cambridge University Press. 402 p.

Kerr, William C., Camillia Lui and Yu Ye. 2018. "Trends and age, period and cohort effects for marijuana use prevalence in the 1984–2015 US National Alcohol Surveys." *Addiction*. October. Vol. 113, no. 3. p. 473–481.

Letki, Natalia. 2006. "Investigating the roots of civic morality: Trust, social capital, and institutional performance." *Political Behavior*. December. Vol. 28, no. 4. p. 305–325.

Lilly, J. Robert, Francis T. Cullen and Richard A. Ball. 2014. *Criminological Theory: Context and Consequences*. Sixth Edition. London: Sage Publications. 568 p.

Macdonald, Ryan and Michelle Rotermann. 2017. "Experimental estimates of cannabis consumption in Canada, 1960 to 2015." (http://www.statcan.gc.ca/pub/11-626-x/11-626-x2017077-eng.htm) *Economic Insights*. December. Statistics Canada Catalogue no. 11-626-X.

Meier, Madeline H., Avshalom Caspi, Antony Ambler, HonaLee Harrington, Renate Houts, Richard S.E. Keefe, Kay McDonald, Aimee Ward, Richie Poulton and Terrie E. Moffitt. 2012. "Persistent cannabis users show neuropsychological decline from childhood to midlife." *Proceedings of the National Academy of Sciences of the United States of America*. October. Vol. 109, no. 40. p. E2657–E2664.

Muhuri, Pradip K. and Joseph C. Gfroerer. 2011. "Mortality associated with illegal drug use among adults in the United States." *The American Journal of Drug and Alcohol Abuse*. May. Vol. 37, no. 3. p. 155–164.

National Academies of Sciences, Engineering, and Medicine. 2017. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. Washington, D.C.: The National Academies Press.

Perreault, Samuel. 2015. "Criminal victimization in Canada, 2014." (http://www.statcan.gc.ca/pub/85-002-x/2015001/article/14241-eng.htm) *Juristat*. November. Vol. 35, no. 1. Statistics Canada Catalogue no. 85-002-X.

Perreault, Samuel and Shannon Brennan. 2010. "Criminal victimization in Canada, 2009." (http://www.statcan.gc.ca/pub/85-002-x/2010002/article/11340-eng.htm) *Juristat*. September. Vol. 30, no. 2. Statistics Canada Catalogue no. 85-002-X.

Roberts, Julian V. 2007. "Public confidence in criminal justice in Canada: A comparative and contextual analysis." *Canadian Journal of Criminology and Criminal Justice*. April. Vol. 49, no. 2. p. 153–184.

Rotermann, Michelle and Ryan Macdonald. 2018. "Analysis of trends in the prevalence of cannabis use in Canada, 1985 to 2015." (http://www.statcan.gc.ca/pub/82-003-x/2018002/article/54908-eng.htm) *Health Reports*. February. Vol. 29, no. 2. Statistics Canada Catalogue no. 82-003-X.

Rotermann, Michelle and Kellie Langlois. 2015. "Prevalence and correlates of marijuana use in Canada, 2012." (http://www.statcan.gc.ca/pub/82-003-x/2015004/article/14158-eng.htm) *Health Reports*. April. Vol. 26, no. 4. Statistics Canada Catalogue no. 82-003-X.

Secades-Villa, Roberto, Olaya García-Rodríguez, Chelsea J. Jin, Shuai Wang and Carlos Blanco. 2015. "Probability and predictors of the cannabis gateway effect: A national study." *Journal of Drug Policy*. February. Vol. 26, no. 2. p. 135–142.

Van Gundy, Karen and Cesar J. Rebellon. 2010. "A life-course perspective on the 'Gateway Hypothesis.'" *Journal of Health and Social Behavior*. September. Vol. 51, no. 3. p. 244–259.

van Ours, Jan C. and Jenny Williams. 2011. "Cannabis use and mental health problems." *Journal of Applied Econometrics*. Vol. 26, no. 7. p. 1137–1156.

Volkow, Nora D., James M. Swanson, A. Eden Evins, Lynn E. DeLisi, Madeline H. Meier, Raul Gonzalez, Michael A.P. Bloomfield, H. Valerie Curran and Ruben Baler. 2016. "Effects of cannabis use on human behavior, including cognition, motivation, and psychosis: A review." *Journal of the American Medical Association: Psychiatry*. March. Vol. 73, no. 3. p. 292–297.

Volkow, Nora D., Ruben D. Baler, Wilson M. Compton and Susan R.B. Weiss. 2014. "Adverse health effects of marijuana use." *The New England Journal of Medicine*. June. Vol. 370. p. 2219–2227.

Williams, Jenny and Anne Line Bretteville-Jensen. 2014. "Does liberalizing cannabis laws increase cannabis use?" *Journal of Health Economics*. July. Vol. 36. p. 20–32.